

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

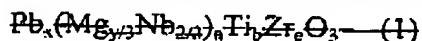
1. (Currently Amended) A method for producing a piezoelectric element comprising the steps of:

providing a ceramic substrate;

superposing a piezoelectric material made of on one of said ceramic substrate and an electrode formed on said ceramic substrate, said piezoelectric material having a piezoelectric ceramic composition containing comprising a $\text{PbMg}_{1/3}\text{Nb}_{2/3}\text{O}_3$ - PbZrO_3 - PbTiO_3 ternary system solid solution composition as a main component, represented by the following a general formula of $\text{Pb}_x(\text{Mg}_{y/3}\text{Nb}_{2/3})_a\text{Ti}_b\text{Zr}_c\text{O}_3$, wherein $0.95 \leq x \leq 1.05$, $0.8 \leq y \leq 1.0$, and a, b and c are decimals in a range of (a,b,c) = (0.550, 0.425, 0.025), (0.550, 0.325, 0.125), (0.375, 0.325, 0.300), (0.100, 0.425, 0.475), (0.100, 0.475, 0.425) and (0.375, 0.425, 0.200) in coordinates having coordinate axes of said a, b and c values, wherein $a+b+c = 1.00$, (1) as a main component and said piezoelectric composition also including 0.05 to 10.0 mass% of NiO on a ceramic substrate or on an electrode formed on the ceramic substrate, and;

providing a container defining a space having a volume and including an atmosphere, said atmosphere comprising an atmosphere-controlling material having the same composition as said piezoelectric material and including 0.03 to 0.5 mg/cm³ of NiO per unit volume of said space; and

subjecting the said superposed piezoelectric material to a thermal treatment in an said atmosphere, where 0.03 — 0.5 mg/cm³ (NiO conversion amount per unit volume of a space in a container) of an atmosphere-controlling material having the same composition as the piezoelectric material is coexisted,



wherein $0.95 \leq x \leq 1.05$; $0.8 \leq y \leq 1.0$; a, b and c are decimals falling in a range surrounded by $(a,b,c) = (0.550, 0.425, 0.025), (0.550, 0.325, 0.125), (0.375, 0.325, 0.300), (0.100, 0.425, 0.475), (0.100, 0.475, 0.425)$ and $(0.375, 0.425, 0.200)$, in the coordinates with coordinate axes of said a, b and c, and $a+b+c = 1.00$.

2. (Currently Amended) A method for producing a piezoelectric element comprising the steps of:

providing a ceramic substrate having an electrode formed thereon;

superposing a piezoelectric material made of on said electrode formed on said ceramic substrate, said piezoelectric material having a piezoelectric ceramic composition containing comprising a $\text{PbMg}_{1/3}\text{Nb}_{2/3}\text{O}_3$ - PbZrO_3 - PbTiO_3 ternary system solid solution composition as a main component, represented by the following a general formula (1) as a main component and of $\text{Pb}_x(\text{Mg}_{y/3}\text{Nb}_{2/3})_a\text{Ti}_b\text{Zr}_c\text{O}_3$, wherein $0.95 \leq x \leq 1.05$, $0.8 \leq y \leq 1.0$, and a, b and c are decimals in a range of $(a,b,c) = (0.550, 0.425, 0.025), (0.550, 0.325, 0.125), (0.375, 0.325, 0.300), (0.100, 0.425, 0.475), (0.100, 0.475, 0.425)$ and $(0.375, 0.425, 0.200)$ in coordinates having coordinate axes of said a, b and c values, wherein $a+b+c = 1.00$, said piezoelectric composition also including 0.05 to 10.0 mass% of NiO on a ceramic substrate or on an electrode formed on the ceramic substrate, and;

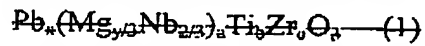
providing a container defining a space having a volume and including an atmosphere and a setter provided within said space, said atmosphere comprising an atmosphere-controlling material having the same composition as said piezoelectric material and including 0.03 to 0.5 mg/cm³ of NiO per unit volume of said space;

providing said superposed piezoelectric material within said space of said container; and

subjecting the said superposed piezoelectric material to a thermal treatment in an said atmosphere;

wherein 0.03 — 0.5 mg/cm³ (NiO conversion amount per unit volume of a space in a container) of an atmosphere-controlling material having the same composition as

the piezoelectric material is coexisted as a container for housing said electrode on which the piezoelectric material is superposed and a setter for mounting the piezoelectric material thereon



wherein $0.95 \leq x \leq 1.05$; $0.8 \leq y \leq 1.0$; a, b and c are decimals falling in a range surrounded by $(a, b, c) = (0.550, 0.425, 0.025), (0.550, 0.325, 0.125), (0.375, 0.325, 0.300), (0.100, 0.425, 0.475), (0.100, 0.475, 0.425)$ and $(0.375, 0.425, 0.200)$, in the coordinates with coordinate axes of said a, b and c, and $a+b+c=1.00$.